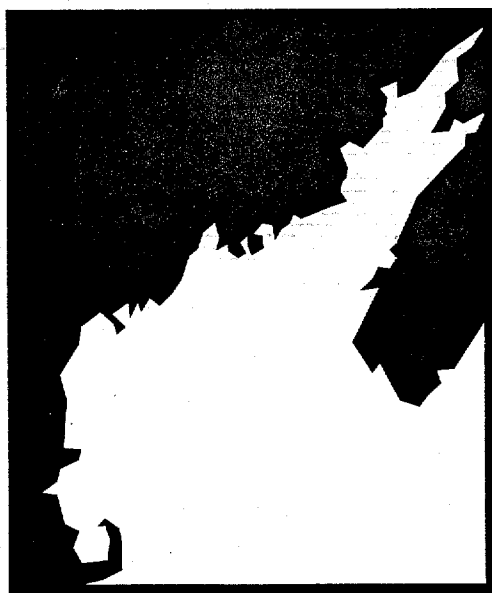


# THE GULF OF MAINE ACTION PLAN

July 1991

Prepared by the Gulf of Maine Working Group  
for the Council on the Marine Environment



GC  
512  
.M3  
G94  
1991

The Gulf of Maine Action Plan was prepared by the Gulf of Maine Working Group, and coordinated by Melissa Waterman, Council on the Marine Environment Secretariat, with support provided by the Federal Office of Ocean and Coastal Resource Management under Section 309 of the Coastal Zone Management Act of 1972, as amended.

## TABLE OF CONTENTS

The Gulf of Maine: An Overview.....page 1

Background to the Action Plan.....page 5

Mission Statement and Definitions.....page 7

### Issue Areas

Monitoring and Research.....page 9

Coastal and Marine Pollution.....page 12

Habitat Protection.....page 15

Education and Participation.....page 17

Protection of Public Health.....page 20

### Appendices

Gulf of Maine Working Group members  
Action Plan Reviewers  
*Agreement on the Conservation of the Marine  
Environment of the Gulf of Maine*

U. S. DEPARTMENT OF COMMERCE NOAA  
COASTAL SERVICES CENTER  
2234 SOUTH HOBSON AVENUE  
CHARLESTON, SC 29405-2413

Property of CSC Library

QC512.M3 G94 1991  
FEB 25 1996

---

# THE GULF OF MAINE COUNCIL ON THE MARINE ENVIRONMENT

## 1990-91 MEMBERS

---

### NOVA SCOTIA

John Leefe  
Minister, Department of the Environment

Guy LeBlanc  
Minister, Department of Fisheries

### NEW BRUNSWICK

Vaughn Blaney  
Minister, Department of the Environment

Denis Losier  
Minister, Department of Fisheries  
and Aquaculture

### MAINE

Dean Marriott  
Commissioner, Department of  
Environmental Protection

Richard Silkman  
Director, State Planning Office

### NEW HAMPSHIRE

Jeffrey Taylor  
Director, State Planning Office

Robert Varney  
Commissioner, Department of  
Environmental Services

### MASSACHUSETTS

Jeffrey Benoit  
Director, Coastal Zone Management Office

Diane Gould  
Director, Massachusetts Bays Program

*A COMMON RESOURCE - THE GULF OF MAINE*

The water body known as the Gulf of Maine extends from Cape Sable, Nova Scotia to Cape Cod, Massachusetts, and includes the Bay of Fundy and Georges Bank. It may be defined in many ways: as a semi-enclosed sea, separated from the Atlantic ocean by underwater banks; as the geographic extent of certain plant and animal species; as an economic resource linking the three American states and two Canadian provinces; and as the foundation of a distinct maritime culture shared by the two countries. Most importantly, however, the Gulf of Maine is a marine ecosystem, comprised of interrelated nutrient cycles, currents and tides, food chains and energy flows. The fish, marine mammals, and birds inhabiting the Gulf region lead transboundary lives, crossing into Canadian or U.S. waters freely. The continued health of the system that sustains those creatures, as well as our own continued reliance upon the system's resources, demands that we manage it as a marine ecosystem, not as a composite of separate and jurisdictionally distinct issues. To sustain the bounty of the Gulf, it must be protected and managed in a coordinated manner.

The Gulf of Maine Action Plan is an attempt by the states of Maine, New Hampshire and Massachusetts and the provinces of Nova Scotia and New Brunswick to rethink their management of the Gulf and to define shared goals to strive toward over the next ten years. Creation of the Action Plan required that the states and provinces recognize their common interests in the Gulf of Maine. The purpose of the Action Plan is best summed up in its Mission Statement: "to maintain and enhance marine environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations." The Action Plan recognizes the current good health of the Gulf and takes a preventative stance toward control of future pollution. Acknowledgement that the resources of the Gulf - fish, clean water, water-based recreational activities - are depletable is emphasized by the Plan's focus on sustainable development.

*Characteristics*

But what is the Gulf of Maine? It is known as one of the world's most productive water bodies. This fact stems from the combined productivity of its seaweeds, salt marsh grasses, and phytoplankton. Two currents dominate water circulation in the Gulf - a counterclockwise current moving through the Gulf and a clockwise current flowing over Georges Bank. A huge volume of water coming from the major rivers that enter the Gulf, from waters flowing around southwest Nova Scotia, and from deep waters coming through the Northeast Channel, powers these currents. It takes about three months for water to circulate around the periphery of the Gulf.

The Gulf of Maine is considered one of the premier marine environments of the eastern seaboard. The foundations of the Gulf's great biologic abundance are the single-celled phytoplankton and the macroalgae, known as seaweed. Phytoplankton bloom during the spring and summer months, when sun-lit waters are rich in nutrients. Georges Bank is the area of highest productivity in the Gulf's offshore waters. Lowest productivity occurs in the deep Gulf waters and along the southern edge of Georges Bank. Yet, in comparison to other shelf ecosystems, all of the Gulf of Maine has high primary productivity levels.

The parts of the Gulf familiar to most people are the coast and adjacent waters. Among the varied habitats that comprise the Gulf's extensive coast, the Gulf's numerous estuaries, such as the Annapolis River estuary in Nova Scotia or the Great Bay Estuary in New Hampshire, are among the most productive. These estuaries are thought to be vital at some life stage to 70 percent of the commercially-valuable fish species of the Gulf.

Salt marshes and mud flats are other characteristic features of the coast. Mud flats are found in shallow, protected waters. Small invertebrates live in the mud, providing food for fish, crustaceans, and birds. The salt marsh plants provide food and cover for both marine and terrestrial organisms, trap sediments, and add nutrients to the system through decomposition. Rocky intertidal shores are another characteristic habitat of the Gulf. These shores are high energy environments where plants and animals must adhere themselves to hard surfaces to survive breaking waves. The Gulf coast also includes sand, gravel, cobble and boulder beaches. Microorganisms

and tiny invertebrates are the dominant organisms of the region's sand beaches and provide food for migratory shore birds.

Thousands of islands lie along the Gulf's coast. Some are sandy barrier islands, common along the Massachusetts coast. The majority, however, are rocky outcroppings found along the Maine coast. The islands support nesting seabirds, seals and shellfish along with traditional human communities. Due to their geographic isolation, valuable examples of unique vegetative communities and rare plant species exist on some islands. Off shore, the Gulf's shallow subtidal habitats feature a variety of macroalgae, including kelp and eelgrass. The kelp and eelgrass, in turn, provide food and protection to marine organisms such as sea urchins and sand dollars. Sea scallops, winter flounder and lobster also are found within these habitats during certain seasons of the year.

An array of animal species live within the Gulf region. More than 18 species of marine mammals are present in the Gulf at various times during the year. From late spring into the fall, the endangered northern right whale feeds and courts in Gulf waters. The Gulf's many habitats make it a hospitable region for a variety of bird species. The mud flats and sand beaches provide food for shorebirds as they migrate between their Arctic breeding grounds and southern wintering locations. A Hemispheric Shorebird Reserve has been established at the head of the Bay of Fundy in order to protect habitat for the half million semipalmated sandpipers and other endangered shorebirds that visit the area each year. Great blue herons, osprey and bald eagles feed and breed near the Gulf's estuaries. Shallow subtidal habitats supply food for diving ducks, such as eiders, buffleheads and scoters. During the winter months, great flocks of these birds can be seen floating just off the coast.

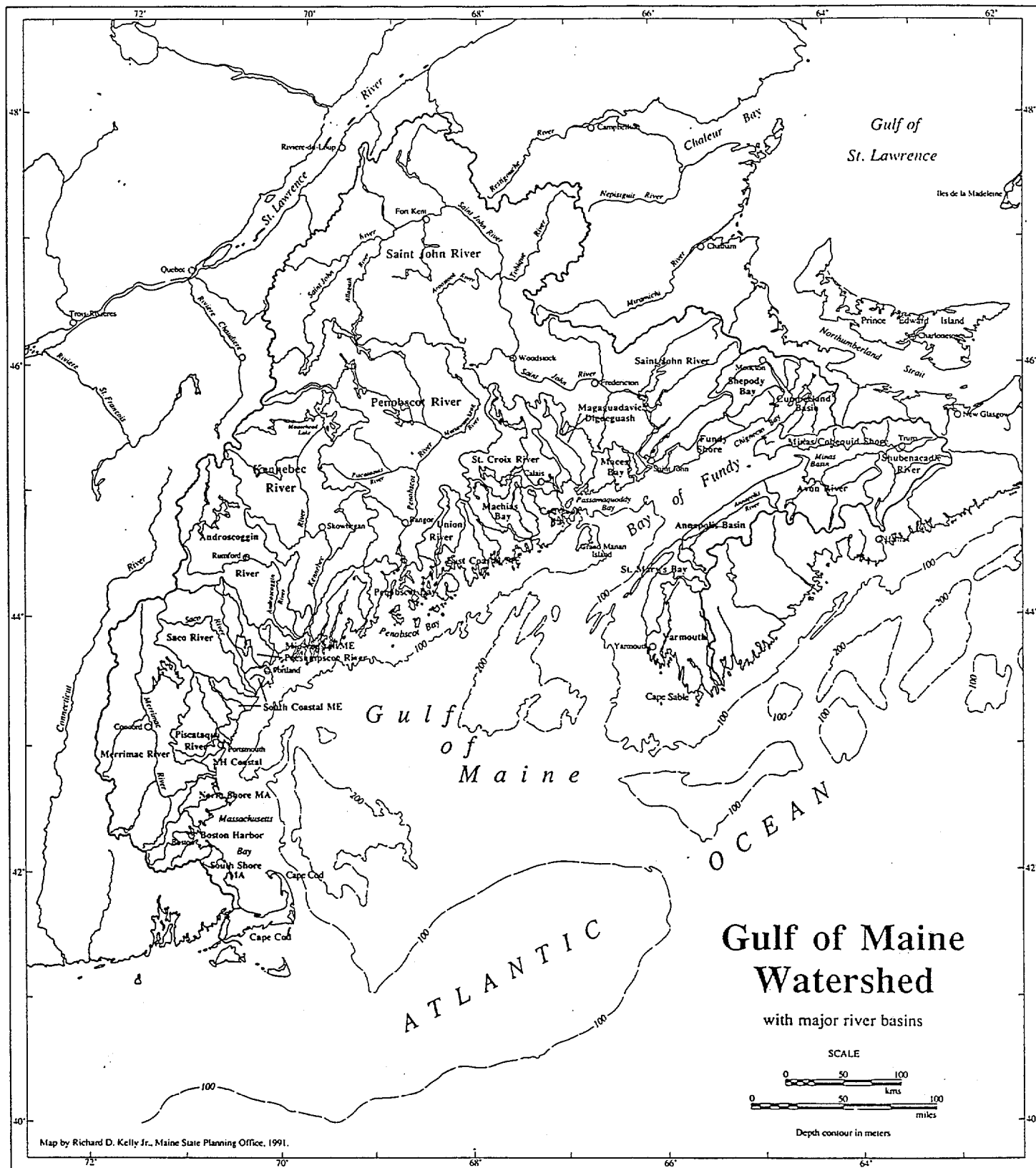
#### *Values*

Historically, the Gulf has been the preeminent source of livelihood for residents along its shores. During recent decades, use of its resources has expanded, as more and more people make recreational use of the Gulf's rich waters and often unspoiled shores.

Fishing remains the principal commercial venture in the Gulf of Maine. In Gulf waters, nearly 20,000 fishermen operate approximately 300 Canadian and 1,350 American fishing vessels, as well as 4,000 lobster boats in the two countries. Since the extension of national jurisdictions to 200 miles offshore in 1977, fishing effort in the Gulf has grown sharply, while fish landings in each country have steadily declined. Consequently, other fisheries have taken shape during the past decade. A sea urchin fishery prospers in Maine, generating an estimated \$2-3 million in value in 1988. Seaweed harvesting is a growing business in Nova Scotia, where 55 million pounds were harvested in 1988. Aquaculture ventures, concentrating on Atlantic salmon, trout, mussels, oysters, and quahogs, also are increasing in number in each jurisdiction.

Tourism is another form of resource use that is growing throughout the Gulf region. Millions of people visit the Gulf coast each year in order to enjoy beautiful land and seascapes and recreational opportunities. Some tourism businesses, such as whale watching, are based entirely upon the Gulf's unique characteristics. Others, such as resorts, restaurants, or even second-home development, are based simply on the beauty of the Gulf coast. While the economic value of tourism to each Gulf state and province is hard to determine, it is recognized to be a major contributor to the state and provincial economies as well as a critical source of revenue to small coastal communities.

Another use of the Gulf, which is in conflict with some of those previously mentioned, is its value as a repository of wastes. The Gulf is used to assimilate sewage, industrial effluent, urban runoff, and air pollution. The true damage caused by our long-term chronic and cumulative pollution of the Gulf is not quickly determined, for the economic effects of disposal of these wastes in the ocean are rarely calculated. However, the cost includes the loss of other valued uses, such as shellfish harvesting or recreational swimming.



Map by Richard D. Kelly Jr., Maine State Planning Office, 1991.

The uses we make of the Gulf and their value to us are constantly evolving. Yet, we must recognize that nearly all depend on a healthy marine environment. The health of the Gulf ecosystem is integrally connected to the quality of our own lives.

### *Stresses*

Our use of the Gulf of Maine and of its surrounding lands has put stress on the marine environment by altering habitat, introducing contaminants, and influencing population dynamics. This stress has escalated as use of both land and water has intensified. It is our smaller, dispersed activities that continue to have a cumulative effect on the ecosystem.

Population growth and land use changes have produced the most visible impacts on Gulf waters and surrounding lands. Historically, cities and their industries were located on major waterways, which then were used both for power and for transport. Development in the Gulf concentrated around major ports such as Boston or St. John. After World War II, and most recently, during the 1980's, population and land development grew dramatically in the Gulf region, specifically on the coast. Within the region, population growth currently is approximately twice as fast in the U.S. states as in the two provinces.

Growth of the population has changed the type and intensity of land use in parts of the Gulf region. Along the southwestern Gulf coast, agricultural lands have been converted to residential development. This conversion process extends up to mid-coast Maine. Changes in land use have hastened the destruction of coastal habitat. Since the time of European settlement, approximately 65 percent of the tidal flats and marshes in the Maritime provinces have been altered or lost. A recent report by the U.S. Fish and Wildlife Service estimates that approximately 1,511,000 acres of inland and saltwater wetlands have been lost since the time of the American Revolution. Projected sea level rise will further affect wetlands and other coastal habitats. Continued coastal development on beaches and dunes exacerbates natural erosion processes. The jetties and seawalls built to stabilize sands beneath ill-chosen house sites simply hasten erosion. Even those barrier beaches now protected as parks or reserves are threatened by the effects of adjacent development.

As land use intensifies, so do the effects of non-point source pollution. Non-point sources of pollution to the Gulf represent the greatest threat to the nearshore environment because of their pervasive character, their cumulative effect, and the difficulty of control or abatement. Urban runoff, road runoff, forest and agricultural runoff, failing septic systems, shipping and boating activities, and deposition of airborne contaminants continue to affect the quality of the waters and natural resources of the Gulf.

Failing and inadequate residential septic systems located along the estuaries or on the Gulf coast introduce nitrogen, phosphorus, chlorine, viruses and bacteria into coastal waters. The effect of such pollution is to close shellfish areas to harvestors or to close beaches to swimming. In addition, discharges from recreational boats and ships contribute bacteria and nutrients, as well as lead, copper and tributyl tin from bottom paints. In the Gulf as a whole, such contaminants do not pose a measurable problem. However, in congested harbors and anchorages, such discharges have become a concern.

Point-sources of pollution come from industrial plants, such as pulp and paper mills, fish processing plants, textile mills, metal fabrication and finishing plants, municipal sewage treatment plants, and chemical and electronic factories, all of which are found along the Gulf. Many industries have improved their waste effluent, in response to public pressure and government regulations, but they still legally discharge an array of metals, petroleum hydrocarbons, and other toxic contaminants. Several hundred industries around the Gulf pump their wastes directly into coastal waters. In the United States, the majority of industries send their wastes to the local municipal treatment plants, which were not designed to handle complex industrial effluents. It is estimated that over a ton of toxics is discharged daily into Boston Harbor from its two municipal treatment facilities.



Sewage treatment will continue to be a concern as the regional population grows. Within many cities, sewage treatment facilities are antiquated and cannot handle a growing volume of sewage. In some cities, such as St. John, sewage is collected but receives little or no treatment. Often sewage effluent may be treated with chlorine, a chemical of concern because of its potential toxic effects on marine organisms. In some urban areas, storm drains are connected to the sewage system, causing the treatment facilities to become overloaded after a rainstorm. As a consequence, large amounts of nutrients, bacteria, metals, toxics, oil and other contaminants are discharged together into coastal waters.

Dredging projects in the region result in the disposal of dredged materials within Gulf waters. There are four major dredge disposal sites in the U.S. portion of the Gulf. In Maine alone, 4.5 million cubic yards of material have been dredged by the Army Corps of Engineers between 1950 and 1989. The dredging and dumping of material may adversely affect the marine environment. Pollution can be spread by moving contaminated sediments from harbors to clean, open ocean areas. Bottom-dwelling communities can be destroyed by the dredging or disposal of materials in the ocean.

Another cause for concern in the Gulf is the large volume of oil shipped to its ports. In 1986, 1,974,000 gallons of oil entered the port of Portland; 3,390,000 gallons entered the port of St. John. In 1987, the port of Boston ranked seventh highest nationwide among oil handling ports. In the past, several spills, ranging from 200,000 to 600,000 gallons, have occurred in Gulf ports. The United States and Canada are both parties to a treaty that establishes cooperative procedures in the event of an oil spill in the Gulf of Maine. In addition, all the states and provinces have regulations intended to prevent minor or major oil spills. Yet, the potential for a catastrophic oil spill still exists.

#### *The Future*

The greatest threat to the health of the Gulf comes from the long term effects of introducing small and seemingly insignificant quantities of persistent toxic materials to marine waters. The sub-lethal effects of this chronic contamination can cause significant changes in such ecosystem properties as productivity, recruitment, reproduction and community composition. These changes are not easy to discern yet they are the warning signs of environmental degradation, difficult if not impossible to reverse.

Everything within the watershed of the Gulf of Maine is connected. Our activities on the land matter as much, if not more, than our activities in the water. The effects of these activities are becoming increasingly apparent. We have lost some preferred uses of the Gulf: shellfish beds are closed to harvestors, estuaries are losing wetlands and consequently, the habitat critical to juvenile fish and shellfish, sea bird habitat is disappearing, coves and harbors are plagued by nuisance algae during the summer months. The complexity of the Gulf system requires an equally complex response from the states and provinces that border it. As requested by the region's governors and premiers, the Gulf of Maine Action Plan represents a coordinated response by the states and provinces to some of the issues threatening the integrity of the Gulf.

### *The Need for an Action Plan*

Marine ecosystem health is dependent upon a multitude of interwoven biological, physical, chemical and geological factors, many of which are not fully understood. Thus, a proper management approach for any marine water body must reflect the interrelated nature of the ecosystem. The Gulf of Maine illustrates the need for a coordinated approach to environmental management, for the boundaries that define the Gulf of Maine are physical rather than political.

### *Developing the Action Plan*

The great biologic wealth of the Gulf of Maine has been shared for centuries by the bordering states and provinces as well as by other nations, though not without occasional conflict. It is this shared history that has provided a strong foundation for cooperative efforts by the states, provinces, and federal agencies to draft a Gulf Action Plan intended to protect the Gulf's environmental integrity. The Gulf of Maine Action Plan is a document that outlines the goals and principles that the states and provinces bordering the Gulf agree to pursue during the next ten years. Within the Plan, state, provincial, and federal agencies, as well as environmental organizations and interested citizens, articulate the goals and objectives that they consider most important to address. These goals and objectives lie within the overall context of the Plan's mission statement: "to maintain and enhance marine environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations."

The Action Plan focuses on transboundary issues, rather than specific state, provincial, or local problems. Much can be accomplished when the governments of three states and two provinces, as well as federal agencies, find compatible methods to pursue common goals. Yet a policy document that refuses to acknowledge the cultural realities of the region would be an ill-formed and unsupportable plan. There are two great values inherent within the Gulf of Maine system, recognized by the Gulf Action Plan: the existence of an incredibly diverse and productive ecosystem and the existence of distinct economic and social benefits derived from that system by the region's residents. At a policy level, one of the purposes of the Action Plan is to maintain the natural and cultural heritage of the region through protection of its environmental quality and support of sustainable resource use.

### *Foundations of the Plan*

The Action Plan evolved from an international conference titled **The Gulf of Maine - Sustaining Our Common Heritage**, held in December, 1989, in Portland, Maine. At that conference, scientists, policy makers, fishermen, marine trades people, and interested citizens listened to technical papers on six Gulf issues. Based on those six issue areas, more than 250 participants were divided into small "working sessions" where specific problems and possible actions were identified and discussed. The mix of participants and the focused nature of the working sessions resulted in concise lists of actions deemed necessary to meet existing and future problems in the Gulf. These summaries, found in the conference *Proceedings*, later formed the basis of the Action Plan.

At that conference, the two premiers and three governors signed the *Agreement on the Conservation of the Marine Environment of the Gulf of Maine*, which established the Gulf of Maine Council on the Marine Environment (Gulf Council). The Gulf Council's ten appointed members were charged to develop a regional marine environmental quality monitoring plan and a ten-year Gulf of Maine Natural Resources Action Plan, among other things. The Gulf of Maine Working Group, management committee of the Council, has overseen both initiatives.

The United Nations Environmental Program's Regional Seas Program and existing water body management efforts in the United States and Canada were used as examples when devising the structure of the Action Plan. Several iterations of the Plan's outline were reviewed by the Working Group prior to the Council's agreement on the Plan's goals and objectives at their June, 1990 meeting. An initial review of the document by state, provincial, and federal agencies took place during September and October of that year. The Council then reviewed

a draft Action Plan in November, 1990, containing goals, objectives, and specific actions. Public review of the draft Action Plan was held during the winter, with over 75 agencies, organizations, and individuals offering comments on the structure, content, and priorities of the Plan. In response to public comments, the Working Group revised the draft Plan in March, 1991, before offering the final draft version to the Council at their July, 1991, meeting.

#### *Priorities within the Plan*

Given an Action Plan of tremendous scope, covering issues from public health to habitat restoration, the Working Group recognized the need to identify priorities among the many objectives in the Plan. Priorities were based on an assessment of the immediacy of need, the likelihood of success, and the public awareness benefits of the objective. Based on these, the Working Group came up with seven high priority objectives:

- \* to encourage generation of appropriate and timely monitoring information to environmental and resource managers and the general public in order to allow both efficient and effective management action, evaluation, and public awareness of such action.
- \* to assist in the reduction of impacts of point source pollution on the Gulf of Maine
- \* to facilitate regional efforts to assure proper disposal of debris and vessel wastes within the marine environment of the Gulf.
- \* to evaluate existing laws and regulations relating to Gulf natural resources in order to reduce disparities and improve performance of those laws and regulations.
- \* to assist in the reduction of impacts of non-point source pollution on the Gulf of Maine.
- \* to promote the protection, restoration, and enhancement of fish and wildlife habitat within the Gulf of Maine region.
- \* to develop and implement a regional citizens' education and participation program with the intent of involving citizens in local resource management issues.

Of these seven, the first four are highest in priority and are included in the Council's 1991/92 workplan. The remaining three objectives and related actions will be addressed in the 92/93 and 93/94 Council workplans. The thirteen objectives and related actions not started during the first three years will be undertaken in three-year increments thereafter. The Plan as a whole will be reevaluated by 1994 - at that time its goals and objectives must be reassessed, progress during the first three years evaluated, and review of identified priorities undertaken. It is probable that, as existing state, provincial, federal and Council projects progress, new information will become available to indicate where greater efforts or research should be directed.

#### *Conclusion*

The Action Plan indicates the consensus of the states and provinces that the ecological integrity of the Gulf of Maine supercedes other interests. The Plan should be considered representative of agreement - agreement between governments and agencies and among states and provinces on the directions to be followed and actions to be taken in the near future. Funding for particular actions will come from a multitude of sources, some existing, some to be devised. Given myriad existing environmental programs, regulations, and policies, Plan implementation will vary from jurisdiction to jurisdiction. The Gulf Council is responsible, as per the 1989 *Agreement*, for reviewing progress on implementation of the actions in the Plan regularly and reporting that progress to the governors and premiers. How the goals and objectives are achieved invariably will depend on state, provincial and federal commitments; the key to the Action Plan is that all agree on the goals and objectives they are striving for.

## ACTION PLAN MISSION STATEMENT

TO MAINTAIN AND ENHANCE MARINE ENVIRONMENTAL QUALITY IN THE GULF OF MAINE AND TO ALLOW FOR SUSTAINABLE RESOURCE USE BY EXISTING AND FUTURE GENERATIONS

### Definitions:

**GULF OF MAINE:** land and water from Cape Sable to Cape Cod, including Georges Bank, the Bay of Fundy and tidal estuaries

**ACTION PLAN:** a compilation of agreed-upon goals and objectives and a list of specific strategies or actions that will achieve the objectives for each goal

**GOAL:** general statement describing what is to be achieved in the future. Goals reflect a consensual vision for a specific or general resource.

**OBJECTIVE:** milestones that, as achieved, incrementally attain goals

**ACTION:** a specific activity undertaken to achieve the objective, which identifies lead agents and final products.

**SUSTAINABLE DEVELOPMENT:** use of resources that meets present needs without compromising continued resource use by future generations

**POLLUTANT:** introduction by man, directly or indirectly, of substances or energy into the marine environment which results in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality for use of sea water, and reduction of amenities (GESAMP, 1986)

**CONTAMINANT:** an addition to the marine environment that alters the marine environment but does not cause measurable adverse effects (GESAMP, 1986)

### *Role of the Gulf of Maine Council with regard to the Action Plan*

The Gulf of Maine Council on the Marine Environment plays a crucial role in implementation of the Gulf Action Plan. The *Agreement on Conservation of the Marine Environment of the Gulf of Maine*, signed in 1989 by the five governors and premiers of the region, established the Gulf Council. Comprised of state and provincial agency directors and ministers, the Council's mission is to discuss and act upon Gulf environmental issues of common concern. As a link among the many state, provincial and federal agencies involved in Gulf management, the Gulf Council will facilitate efforts by the five jurisdictions to maintain and enhance the health of the Gulf. Council support will come in many forms including dissemination of scientific data, improved state, provincial and federal communications, funding assistance, and heightened public awareness.

With respect to the Action Plan, the Gulf Council's GOAL is: to develop interjurisdictional mechanisms for resolving environmental problems within the Gulf region.

The Council will pursue this GOAL by:

- supporting existing and future regional agreements on shared environmental issues of concern, including but not limited to state/provincial oil spill contingency plans and scientific response plans, land-based toxics reduction plans, and regionally significant habitat protection plans;
- supporting regional efforts that facilitate the coordination of appropriate research initiatives in the region;
- encouraging compatible Gulf of Maine public education and participation initiatives in the region;
- supporting regional efforts toward improved coordination of marine and coastal management and enforcement programs;
- supporting regional efforts to develop funding options for components of the Action Plan; and
- advising member governments of federal activities in the Gulf of Maine of mutual interest.

Actions which the Council takes in striving to achieve these objectives, based on the priorities of the Action Plan, will be found in the Council's yearly work plan.

### *Format of the Action Plan*

There are three discrete categories of objectives within the Action Plan, based on identification of their priority rating. Seven objectives have highest priority within the overall Plan. Four of those seven are to be initiated during the 1991/92 fiscal year, and are included within the Council's annual work plan. Those four objectives and the related actions are identified as *1991 Priorities*. The remaining three highest priority objectives are found within the Plan as *1991-92 Priorities*.

The next category of objectives covers the second tier of priorities, those planned for initiation in 1994-1997. These objectives remain priorities but did not rank as highly as did the seven mentioned above. The final category of objectives are those that will be tackled in the years 1997-2000. Generally, these objectives pertain to related tasks begun earlier and so were not rated as highly as the previous two categories.

The Action Plan will be evaluated and revised in 1994 by the Gulf Council. At that time categorization of the objectives can be revised by the states and provinces. Thus, these initial priorities cannot be seen as fixed; they reflect priorities as presently perceived by the Gulf Council.

## MONITORING AND RESEARCH

### *Introduction*

The key to understanding the chemical, biological, geological and physical processes of the Gulf of Maine is research. Relevant research and monitoring programs will provide data and information necessary to predict the fate and effects of pollutants, as well as to determine the efficacy of regulatory actions. Even with the current level of research, we are only beginning to delve into the complex natural systems of the Gulf.

### *The Monitoring Environmental Quality Monitoring Program*

In 1988 and 1989, the three states received a federal grant to design a Marine Environmental Quality Monitoring Program for the Gulf of Maine. Representatives from state, provincial, and federal agencies worked together to craft a plan that draws upon the efforts of other existing monitoring programs in the Gulf as well as presenting new monitoring initiatives. The mission of the Gulf of Maine Marine Environmental Quality Monitoring Program is to provide environmental and resource managers with information to support sustainable use of the Gulf, and allow assessment and management of risk to public and environmental health from current and potential threats.

Rather than include the text of the entire Monitoring Program document here, a brief summary of the program follows. A copy of the complete Gulf Marine Environmental Quality Monitoring Program may be obtained from the Gulf Council Secretariat office. The Marine Environmental Quality Monitoring Program has three broad goals. It will provide information on the status, trends, and sources of risks to the marine environment of the Gulf; provide information on the status, trends, and sources of marine-based human health risks in the Gulf; and provide appropriate and timely information to environmental and resource managers that will allow both efficient and effective management action and evaluation of such action.

Ten objectives were established to meet the three goals. A survey mailed to over 150 scientists, policy makers and environmental managers around the Gulf determined the two highest priority monitoring objectives:

1. to assess the status and trends in the marine environment by monitoring appropriate indicators of change in environmental quality, especially those that will allow identification of the early stages of change

and

2. to assess the existing levels, the trends, sources, and economic impacts of acute and chronic risks to human health from toxic compounds transmitted through marine foods and water contact.

A final high priority issue that could not be categorized with actual monitoring activities was the goal of providing for the effective transfer of information to managers and the public. This goal, which was given high priority within the monitoring plan, was also rated the highest priority objective of the Gulf Action Plan.

**RESEARCH**, goal: to obtain and make available information required by resource managers to sustain the Gulf of Maine ecosystem

**Research Objectives:**

*1991 priority*

1.1 to encourage generation of appropriate and timely Gulf environmental information for managers and the general public in order to allow both efficient and effective management action and evaluation, and to promote public awareness of such action.

*Actions*

1.1.1 the Gulf Council will seek agreements among state, provincial and federal agencies to promote establishment of a common database derived from current research and monitoring programs in the Gulf of Maine

1.1.2 the Gulf Council, through its Data and Information Management Committee, will determine methods to ensure that Gulf environmental databases are compatible and will recommend a regional protocol for transfer of data and information throughout the region

1.1.3 the Gulf Council, through its Data and Information Management Committee, will develop a Gulf science and research index/directory that lists information on current Gulf research activities, is geographically and thematically referenced, is accessible by computer, is updated regularly, and is available to environmental managers and to scientists.

*1994 priority*

1.2 to establish protocols to standardize methodologies and create compatible Quality Assurance/Quality Control agreements for monitoring of Gulf environmental quality

*Actions*

1.2.1 appropriate state, provincial and federal agencies, and university research laboratories should negotiate a system to assure high-quality, consistent data with regard to Gulf scientific research

1.2.2 university laboratories, state and provincial laboratories, and private contractors should develop Quality Assurance/Quality Control agreements that assure consistent and compatible analytical results within the region

*1997 priority*

1.3 to coordinate approaches to marine research by federal, state and provincial agencies and among private laboratories

*Actions*

1.3.1 a regional task force should be established to coordinate information on the impacts on the Gulf of Maine coastline of projected sea level rise.

1.3.2 state, provincial and federal agencies and private laboratories should develop an integrated research program devoted to improved understanding of the Gulf of Maine as a combined physical, chemical, and biological system

1.3.3 the Gulf Council should work with the states, provinces and appropriate federal agencies to articulate marine research priorities at multiple governmental levels in order to, among other things, structure funding allocations, improve competitive status of regional marine research proposals, and meet specific management needs

1.3.4 the Gulf Council should work with state, provincial, and federal agencies and universities to support research projects on and develop funding sources for the following topics:

- a) accurate estimates of dose relationships of pathogens to humans and "allowable concentrations"
- b) the role of sediments as reservoirs of pathogenic microorganisms
- c) the synergistic effects between pathogens and toxic chemicals
- d) methods that detect indigenous pathogens that are not related to fecal contamination

---

*1997 priority*

1.4 to improve assessment of harvesting method effects on Gulf of Maine productivity

---

*Actions*

1.4.1 federal, state and provincial agencies, Sea Grant College programs and comparable university programs in Canada should give high priority to research on the effects of harvesting methods on Gulf productivity

1.4.2 state, provincial and federal agencies should agree on specific research projects relating to harvesting methods and develop a timetable for initiation of projects



## COASTAL AND MARINE POLLUTION

*Introduction*

Too often our view of the marine environment takes form as a type of aquatic mirror: we most frequently notice changes in water quality only as they effect our own lives. Yet, the Gulf of Maine is a natural resource over which we exercise stewardship, not ownership. As stewards, we protect the marine environment of the Gulf without the demand that it provide recreation, employment and food for us. Typically, however, stewardship falls second to proprietary notions when we view our environment. In fact, we protect the Gulf's environmental quality primarily as a means of ensuring the uses of the Gulf that we value.

Recent studies indicate that the Gulf of Maine, as a system of interrelated physical, chemical, biological and geological features, is suffering. Samples show that sediments in the deep offshore basins of the Gulf of Maine contain low but unnatural concentrations of toxins. Fish samples collected in specific sites by state, provincial and federal agencies exhibit liver lesions, fin rot and other signs of environmental stress. Once infrequent, toxic algae blooms in the Gulf are becoming common events, distinguished from year to year only by their magnitude and impact on marine organisms.

Many forms of pollution flow into the Gulf of Maine. The Gulf has been spared the catastrophe of a large oil spill however, the number of oil tankers traversing the Gulf hints at the possibility of a large spill in the future. Of more immediate concern is the cumulative effect of minor but numerous spills occurring throughout the Gulf each year. A steady stream of pesticides, pathogens, nutrients, petroleum hydrocarbons and trace metals enter the Gulf daily as point and non-point source pollutants. Furthermore, the Gulf's location "downwind" of the industrial states and provinces results in the deposition of a variety of pollutants from the air into Gulf waters.

Clearly, one cannot take a blanket approach to pollution control in such a large area. Strategies must be developed at different geographic levels - at the regional, national, state and provincial, watershed, and community levels. The Coastal and Marine Pollution section of this Plan represents agreement on some regional responses to current water quality issues and on methods to prevent future pollution of the Gulf's coastal and marine waters.

**2.0 Coastal and Marine Pollution, goal:** to reduce impacts from existing pollution sources and to prevent future environmental degradation of the Gulf of Maine

**Objectives:***1991 priority*

2.1 to assist in the reduction of impacts of point source pollution in the Gulf

*Actions*

2.1.1 the Gulf Council will work with state and provincial agencies and with NOAA, EPA and Environment Canada to develop an inventory of industrial and municipal discharges and other sources of pollution into the Gulf and its tidal rivers in order to develop regional knowledge of pollutant inputs to the Gulf. The Gulf Council will then identify specific pollutants and pollutant sources for priority action.

2.1.2 the Gulf Council will develop a resolution that highlights the pollution impacts evident from use of combined sewer overflows in bordering states and provinces and establishes the Gulf Council members' policy on curtailing construction of and mitigating impacts from combined sewer overflows.

2.1.3 the Gulf Council member agencies will select specific marine areas degraded by point sources of pollution within each jurisdiction and will implement appropriate demonstration projects in those areas; a report on progress of the demonstration projects will be made to the Council within two years.

*1992-93 priority*

2.2 to facilitate regional efforts to assure proper disposal of marine debris and vessel wastes within the Gulf

*Actions*

2.2.1 appropriate state, provincial, and federal agencies should conduct a regional assessment of dockside waste and septage facilities and prepare a plan to ensure adequate facilities

2.2.2 the Gulf Council should assist state, provincial, and federal agencies, and community organizations to develop a program targeted at reducing fishing vessel debris in Gulf waters, focused on fishing ports and harbors

2.2.3 the Gulf Council should work with vessel owner organizations and shipping industry associations to encourage accelerated compliance with MARPOL Annex V regulations in Gulf waters

*1992-93 priority*

2.3 to encourage evaluation of existing laws and regulations relating to Gulf natural resources to reduce disparity and improve performance among states and provinces

*Actions*

2.3.1 the Gulf Council should support a study evaluating the federal, state and provincial laws and regulations applicable to the Gulf of Maine with the intention of identifying gaps among the laws and reviewing law enforcement practices and policies

2.3.2 the Gulf Council should encourage state and provincial agencies to issue a report in each state or province, which pinpoints future, high-priority improvements to Gulf-related laws and enforcement programs within that state or province

*1992-93 priority*

2.4 to assist in the reduction of the impacts of non-point source pollution in the Gulf

*Actions*

2.4.1 state, provincial water pollution control agencies, working with appropriate federal agencies, should identify the sources of non-point source pollution to the Gulf and their respective contribution of pollutants; pollution reduction targets should be devised and implemented.

2.4.2 the Gulf Council should assist in evaluation of regional priority non-point source pollution research needs and support specific regional projects

2.4.3 the Gulf Council should assist state, provincial, federal agencies and private organizations in convening regional workshops to review and transfer information regarding successful methods and programs for the control of non-point source pollution.

2.4.4 the Gulf Council should work with state and provincial transportation departments to include Best Management Practices and Techniques in highway design standards in order to contain road runoff

2.4.5 appropriate state and provincial agencies should develop regulations that control runoff rates on developed land other than highways in order to reduce pollutant loadings to the Gulf contained in river or groundwater

2.4.6 state, provincial and federal public health agencies and appropriate environmental agencies, recognizing the fiscal and technical constraints upon the states and provinces, should promote maintenance of individual sewage disposal systems; alternative sewage treatment methods should be investigated by the agencies as a means of opening productive shellfish beds to commercial harvesting

*1994 priority*

2.5 to encourage federal agency cooperation/involvement in state/provincial pollution control actions

*Actions*

2.5.1 the Gulf Council will assist states and provinces in working with appropriate federal agencies to establish compatible standards for marinewater and sediment quality in the Gulf region

2.5.2 state, provincial and federal governments should periodically review the use of Best Management Practices and Techniques at all major federal facilities located on the Gulf perimeter in order to control and abate point and non-point source pollution inputs to the Gulf of Maine

2.5.3 the Gulf Council will support efforts by Environment Canada and the Environmental Protection Agency to develop compatible standards for high priority pollutants in the Gulf region

*1997 priority*

2.6 to ensure the better prevention of and prompt response to the impacts of environmental catastrophes

*Actions*

2.6.1 state and provincial hazardous materials agencies should review individual oil spill contingency plans to devise methods for improved cooperation at local and regional levels

2.6.2 marine industries, universities, and state, provincial, and federal agencies should cooperatively develop a marine catastrophe scientific assessment and monitoring plan which details, at a minimum, priority actions and personnel requirements

2.6.3 the Gulf Council should request the US and Canadian Coast Guards to conduct review of marine transport of hazardous materials, including river and harbor transport, and shipping and shoreside handling processes, in order to assess potential risks and identify improvements

2.6.4 the Gulf Council should request the U.S. and Canadian Coast Guards to initiate a study that examines the merits and estimated costs of developing a coordinated vessel tracking system for the Gulf of Maine

*1997 priority*

2.7 to support development of a regional strategy to minimize impact from disposal of contaminated materials at sea

*Actions*

2.7.1 the state and provincial environmental agencies, in cooperation with appropriate US and Canadian federal agencies, should form an ad hoc work group to identify common dredging issues, including anticipated frequency of dredging activity, projected volume of dredged material, composition of the material, estimates of pollution loadings from current and anticipated dredged material disposal, and evaluation of possible contaminant testing protocols

2.7.2 the Gulf Council should request state, provincial and federal agencies to convene regional workshops every two years for the purpose of information exchange, identification of disposal problems in the Gulf, and discussion of cooperative efforts toward solutions.

## HABITAT PROTECTION

### *Introduction*

The waters and lands of the Gulf of Maine are inextricably woven into the lives of residents of the surrounding states and provinces. The perimeter of the Gulf features a variety of habitats, from rocky coasts to expansive salt marshes. Churned by tides and currents, Gulf waters support a bounty of commercially and recreationally valuable finfish and shellfish species which, for centuries, have sustained the communities along the Gulf's shores.

The estuaries of the Gulf act as pathways to inland waters for migratory fish, such as alewife and Atlantic salmon, and as nurseries for other fish species. The extensive intertidal flats associated with estuaries support tremendous shellfish and worm populations, harvested for generations by recreational and commercial fishermen. Offshore submerged banks and ledges are also places of high productivity. The offshore waters provide feeding grounds for several species of whales during the summer and fall months, including the endangered northern right whale. Flocks of migratory birds settle on Gulf waters and wetlands each spring and fall as they follow their seasonal path along the eastern seaboard.

Whether our interests lie in recreational shell-fishing, real estate sales, or commercial fishing, the health of the Gulf's natural resources affects us economically. The state, provinces and federal governments are beginning to address the issue of sustainable development of resources through such initiatives as the Canadian Green Plan, the provincial Round Tables on Environment and Economy, and the New England Governors-Eastern Canadian Premiers' Environment Committee. To assure the continued sustainable development of our resources, coordinated steps must be taken now.

The problem of overharvesting of the Gulf's fisheries resources is a growing issue, and one currently under debate in American and Canadian forums. There are years of expertise institutionalized in the federal and regional fisheries agencies; it would be presumptuous for the Council or this Action Plan to recommend specific actions to them. For now the question of fisheries management and its effects on the Gulf system must be left to existing institutions.

**3.0 Habitat Protection, goal:** to foster an integrated approach to protection and sustainable use of Gulf of Maine habitats

### **Objectives:**

#### *1991 priority*

3.1 to support the protection, restoration, and enhancement of fish and wildlife habitats

#### *Actions*

3.1.1 the Gulf Council, through its member agencies, will encourage federal, state, and provincial agencies and private organizations, to initiate a multi-phased project which focuses on the protection, restoration, and enhancement of regionally significant habitats

In its first phase, the project will identify existing regionally significant habitats and prepare a report for the Gulf Council indicating the types of habitats existing and existing management programs.

In its second phase, the project will identify those areas not included in current management programs and develop compatible standards for the definition of lost or degraded regionally significant habitats.

In its final phase, the project will develop guidelines, suitable for state, provincial, and federal use, on long-term management and restoration of degraded regionally significant habitats and implement rehabilitation or protection projects based on those guidelines in each state or province.

*1994 priority*

3.2 to support a systematic approach to the identification, classification and protection of coastal and marine habitats of regional concern

*Actions*

3.2.1 the federal, state and provincial wildlife and marine resource agencies, and private organizations should consolidate existing information on fish and wildlife habitats of the Gulf of Maine in a regional form

3.2.2 federal, state and provincial agencies and private organizations should cooperate in the development of a common habitat-mapping system, suitable to the needs of the states and provinces

3.2.3 the Gulf Council should request that appropriate state and provincial agencies review the findings of the UN Regional Seas Program and the UN Man and Biosphere Program on the management of Large Marine Ecosystems; the agencies and the Council should issue position papers for the Governors and Premiers on a proposed Biosphere Reserve within the Gulf of Maine

3.2.4 state, provincial, and federal agencies should meet with private organizations to discuss regulatory programs pertaining to coastal and marine habitats and to jointly propose specific actions for enhanced protection of regionally significant coastal and marine habitats

3.2.5 state, provincial, and federal marine resource and environmental agencies should identify and propose sites for nomination as marine special areas in order to conserve marine habitats in accordance with the Canadian Green Plan and the U.S. *Marine Protection, Research, and Sanctuaries Act*

3.2.6 the Gulf Council should request that state, provincial and federal agencies, private organizations work cooperatively to establish a joint Gulf Marine Mammals Protection plan, in order to set priorities for the protection of habitat critical to marine mammals

*ongoing priority*

3.3 to improve communication among state, provincial and federal agencies, marine interest groups, and environmental organizations about existing management strategies for specific marine resources

*Actions*

3.3.1 the Gulf Council will work with appropriate organizations to convene a regular conference for state, provincial and federal managers, environmental organizations, and marine interest groups to review common problems and management policies for specific coastal and marine resources

3.3.2 the Gulf Council should request that appropriate state and provincial agencies and federal agencies meet to discuss compatible standards regarding site selection and water quality impacts from aquaculture businesses in order to support environmentally appropriate ventures

## EDUCATION AND PARTICIPATION

### *Introduction*

The Gulf of Maine has an enormous watershed. The activities of more than three million people living within the two countries ultimately affect the environmental quality of the Gulf of Maine. All the admonitions, regulations and legislation in the world will not protect the Gulf unless the three million residents and the millions of visitors to the region become aware that their day-to-day activities affect the Gulf. The foundation of that awareness is education.

A strong education program detailing the effects that human activities have upon the health of the Gulf must accomplish two tasks. First, it must enable individuals, whether they live on the coast or along the upper stretches of a river that empties into the Gulf, to see themselves as residents of a particular, though vast, watershed. Secondly, it must engender a sense of stewardship toward the Gulf and the will to act within individuals of all ages and economic status.

Education fuels participation. All too often, our response to important environmental issues such as ozone depletion or contaminated groundwater is fatalistic resignation in the face of a technically complex problem. Residents of the Gulf of Maine watershed must be encouraged to actively participate at the local or regional level in the decisions that will affect the Gulf today and in future years. Furthermore, they must be given real power to take action in their locality, without being forced to wait for the slow attention of state or provincial government to turn their way. This involvement can occur through groups such as watershed associations or citizen monitoring programs. The following Education and Participation goals and objectives illustrate the varied efforts that can be made to inform sectors of the public about the Gulf and their role in maintaining its health.

**4.0 Education and Participation, goal:** to cultivate a sense of stewardship among the citizens of the Gulf region and to enable them to make responsible decisions regarding Gulf of Maine resource use

### **Objectives:**

#### *1991 priority*

4.1 to develop and implement a regional citizens' education and participation program with the intent of involving citizens in local Gulf resource management issues.

#### *Actions*

4.1.1 in order to cultivate a sense of stewardship among the citizens of the Gulf region and to foster responsible decision making regarding use of the Gulf's resources, the Gulf Council will establish a standing education and participation committee to guide implementation of a regional education and participation program.

4.1.2 the Gulf Council, in cooperation with other regional organizations, will develop a Gulf of Maine personnel exchange program for Gulf Council member agencies, in order to share expertise in the fields of coastal and ocean management.

#### *on going priority*

4.2 to create educational materials on the Gulf of Maine for a variety of user groups, including the general public, elected officials, and the media

#### *Actions*

4.2.1 the Gulf Council should produce a regional resource guide to Gulf-related organizations

4.2.2 the Gulf Council should request that state and provincial Tourism Offices display Gulf educational materials at appropriate locations

4.2.3 the Gulf Council should produce a non-technical "State of the Gulf" report every three years that notes environmental trends in the Gulf

4.2.4 Sea Grant programs in the three states should incorporate specific Gulf of Maine educational actions into the next long-term Sea Grant program plan drafted after adoption of this Plan

4.2.5 appropriate private and public agencies and organizations should distribute interdisciplinary Gulf of Maine educational materials for grades K-12, for the use of educators throughout the region

4.2.6 the Gulf Council should create and distribute a Gulf of Maine slideshow and/or documentary that informs the public about the Gulf, the environmental stresses upon it, and options for sustaining its resources

4.2.7 the Gulf Council should request appropriate private and public agencies and organizations to expand Gulf education programs in existing non-academic settings, such as summer camps, Boy or Girl scout programs, or 4-H programs

4.2.8 the Gulf Council should assist appropriate private organizations and public agencies in development of on-the-water educational programs for teachers and students

---

*ongoing priority*

4.3 to foster communication among the scientific community, the media and elected officials

---

*Actions*

4.3.1 universities, in cooperation with the state and provincial environmental agencies, should encourage a sound understanding of environmental sciences by the media through specific educational programs, in order to promote accurate writing about the sciences

4.3.2 the Gulf Council should compile a roster of scientists who are willing and able to speak articulately about Gulf science issues to elected officials and the media to improve public understanding of current Gulf research

4.3.3 the Gulf Council should request the Governors' and Premiers' offices to sponsor Gulf educational events for legislators within the state or provincial capitals in order to promote an informed perspective on the Gulf within the legislatures

4.3.4 the Gulf Council should work with public agencies and private organizations to establish a program that places elected officials and the media on scientific research vessels for short periods of time in order to foster a practical understanding of the natural processes of the Gulf

---

*ongoing priority*

4.4 to improve understanding of Gulf-related issues by specific sectors of the public

---

*Actions*

4.4.1 the Gulf Council should work with appropriate state, provincial, and federal agencies to create educational materials directed at potential marine waste producers (such as recreational boaters, tourists, merchant marine, commercial fishing vessels) for inclusion in respective licenses or permits

4.4.2 the Gulf Council should work with the US National Park Service and Parks Canada to publish a guide to the Gulf coast, which will offer visitors information on the botanic, geologic, biologic, and oceanographic features of the Gulf region

4.4.3 the Gulf Council should work with appropriate institutions, such as the Canadian American Studies Center or the Quebec-Labrador Foundation, to expand Canadian/US fellowship programs, in order to allow students and academicians to teach or conduct research in the states or provinces

4.4.4 the Gulf Council should work with the state Sea Grant College Programs, state and provincial education departments, and the regional National Estuarine Reserves to support a marine teachers/docents program for the region to bring marine sciences into public schools in order to improve regional knowledge of marine topics

---

*ongoing priority*

4.5 to actively support public participation in coastal resource management issues at the local level

---

*Actions*

4.5.1 the Gulf Council should encourage citizen volunteer programs, in conjunction with existing education or research organizations, to involve the public in local stewardship and water quality protection  
(for monitoring programs, state must use the volunteers data; need more technical support from the state, p. 56)

4.5.2 appropriate state, provincial and federal agencies, through their non-point source pollution control programs, should identify methods to work with public and private entities to create a multi-media education program on non-point source pollution effects and controls for homeowners throughout the region

4.5.3 the Gulf Council should request the Governors' and Premiers' offices to investigate the feasibility of establishing a transboundary Coastal Conservation Corps which would provide technical and construction assistance to towns for coastal improvements (i.e. NPS projects, beach clean ups, fishway construction, public access maintenance) and job-training for members



## PROTECTION OF PUBLIC HEALTH

*Introduction.*

The uses that we make of the Gulf of Maine are many. We depend on Gulf water and natural resources to fulfill industrial, commercial and recreational needs. Yet general confidence in the safety of Gulf waters and natural resources seems to be diminishing. Increasing acreages of shellfish beds, closed due to pollution, raises public fears concerning the quality of all shellfish. Similarly, studies indicating high levels of toxic contaminants in Casco Bay or Boston Harbor taint the public perception of all seafood. Incidents of marine debris on beaches or closure of public swimming areas due to poor water quality further harm the public perception of the quality of the Gulf of Maine.

The solution to this dilemma, however, is not to minimize testing of the water and natural resources, or to cloud the results in language confusing to the public. The human health risks from Gulf resources and water must be accurately assessed, using a variety of methods. The public perception of the quality of Gulf resources must be firmly linked to the actual conditions. It is imperative that coordinated strategies for improved testing and monitoring programs be developed by state, provincial and federal agencies, for the economic and, to some extent, cultural life of the Gulf coastal communities depends upon public consumption of the Gulf's many resources.

5.0 Protection of Public Health, goal: to minimize public health risks from use of Gulf of Maine natural resources

**Objective:***1997 priority*

5.1 to support development of an integrated public health protection strategy related to human uses of the Gulf of Maine

*Actions*

5.1.1 the Gulf Council will work with federal, state and provincial agencies to improve the interaction of public health monitoring activities and management activities

5.1.2 state, provincial, and federal public health agencies should evaluate existing programs and develop new programs for monitoring and predicting offshore marine biotoxin events

5.1.3 appropriate state, provincial and federal agencies should evaluate existing and developing monitoring techniques for Gulf waters and shellfish habitat and determine the possibility of compatible regional techniques

5.1.4 appropriate state, provincial and federal agencies should produce reports that recommend methods for more accurate and/or expanded monitoring of pathogens, biotoxins and other contaminants in Gulf waters and habitats to minimize human health risks

5.1.5 the Gulf Council should encourage the U.S. Food and Drug Administration and the Canadian Health Protection Branch and with the Interstate Shellfish Sanitation Conference to promote adoption of more meaningful indicators than the fecal coliform bacteria standard used to assess human health risks from shellfish consumption.

## TIME LINE FOR ACTION PLAN OBJECTIVES

<b>1991-92</b>  4 highest priority objectives  1.1 generation of information 2.1 point source reduction 3.1 protection, restoration, enhancement of habitat 4.1 public education and participation	<b>1992-93</b>  3 next highest priority objectives  2.3 evaluation of existing laws 2.4 non-point source reduction 2.2 marine debris	<b>1993-94</b>  no objectives initiated  begin reevaluation of Action Plan	
<b>1994-95</b>  3 next highest priority objectives  1.2 QA/QC agreements re: monitoring 2.5 federal cooperation with state/provincial actions 3.2 identification, classification, protection of regional habitats	<b>1995-96</b>  no objectives initiated	<b>1996-97</b>  begin reevaluation of Action Plan	
<b>1997-98</b>  4 next highest priority objectives  1.3 coordinate marine research activities 1.4 harvesting method effects 2.6 prevention and response to environmental catastrophes 2.7 minimize impact from	<b>1999-99</b>  no objectives initiated	<b>2000</b>  begin reevaluation of Action Plan	<b>ongoing priority objectives</b>  3.3 improve communication on management of marine resources 4.2 create educational materials 4.3 foster communication among scientists, media, officials 4.4 improve understanding of Gulf issues 4.5 support public participation at local level

---

---

## THE GULF OF MAINE WORKING GROUP MEMBERS

---

---

### NOVA SCOTIA

Peter Underwood  
Department of the Environment

Arthur Longard  
Department of Fisheries

### NEW BRUNSWICK

Bill Ayers  
Department of the Environment

Barry Jones  
Department of Fisheries and Aquaculture

### MAINE

David Keeley  
Maine Coastal Program

James Bernard  
State Planning Office

### NEW HAMPSHIRE

David Hartman  
New Hampshire Coastal Program

### MASSACHUSETTS

Patricia Hughes  
Massachusetts Coastal Zone Management Office

### FEDERAL REPRESENTATIVES

Environmental Protection Agency

Rosemary Monahan  
Region I

National Oceanic and Atmospheric Administration

John Pearce  
Northeast Fisheries Center

Don Scavia  
Coastal Ocean Program

Environment Canada

Wayne Barchard and Alan McIver  
Marine Assessment Division

Department of Fisheries and Oceans

H. Brian Nicholls and Andre Ducharme  
Bedford Institute of Oceanography

## Draft Action Plan Reviewers

---

### *New Brunswick*

Janice Harvey, Hunstman Marine Science Center and the Conservation Council of New Brunswick Coastal Convergence Project Coordinator

David Coon, Policy Director, Conservation Council of New Brunswick

Lee Sochasky, St. Croix International Waterway Commission Director

Mary Majka, Environmental Council of New Brunswick

Inka Milewski, Montreal, Quebec (formerly with Huntsman Marine Science Center)

Steven Backman, Aquaculture veterinarian, Moore-Clark Co.

Edith Miller, Sackville

Muhammad Arif, Department of Municipal Affairs, Land Use Planning Office

J.E. Henri Legare, Assistant Deputy Minister, Department of Fisheries and Aquaculture

John Kershaw, Department of Fisheries and Aquaculture, Aquaculture Office

### *Maine*

David Stevenson, Department of Marine Resources Laboratory

Brian Marcotte, Director, Bureau of Marine Sciences, Department of Marine Resources

Walter Anderson, Maine Geological Survey

John Sowles, Department of Environmental Protection

Charles Whimore, Maine State Conservationist

Esperanza Stanicoff, University of Maine Cooperative Extension

### *Nova Scotia*

Daniel N. Paul, Executive Director, Confederacy of Mainland Micmacs

Raymond Cote, Associate Director, Dalhousie School for Resource and Environmental Studies, Co-director, Marine Affairs Program

Ishbel Butler, The Maritime Fishermen's Union

Ian Christie Clark, President, Nova Scotia College of Art and Design

Jack MacIsaac, Department of Mines and Energy, Office of the Minister

Gordon Gillis, Department of Municipal Affairs

Ken Streach, Department of Small Business Development

Blenis J. Nicholson, Department of Education

Donald P. MacInnes, Department of Transportation and Communications, Office of the Minister

J.M. MacLennan, Department of Advanced Education and Job Training

John Murphy, Senior Advisor, Board of Commissioners of Public Utilities

D.F. Trivett, Department of Consumer Affairs

M.J.A. Butler, C.B. Fay, P.J. Hartling, C. LeBlanc, A.N. Montgomery, on behalf of the Council of Maritime Premiers and the Land Registration and Information Service

Derek Davis, Nova Scotia Museum Complex, Department of Education

John K. Underwood, Environmental Quality Control Manager, Nova Scotia Power

Peter Butler, Council on Higher Education

M.R. Lester, Director, Emergency Measures Organization

R. Clifton Thomson, Chairman, Fisheries Sector, Voluntary Planning

H. W. Doane, President and Chief Executive Officer, Waterfront Development Corp. Ltd.

Brigitte Neumann, Director, Women's Directorate

John MacGregor, Sector Coordinator, Environment and Economy, Voluntary Planning

B. E. Rogers, Liquor Commission

Margaret Swan, Literacy Nova Scotia

David J. C. Waterbury, Chairman, Criminal Injuries Compensation Board

Martin H. Bushell, Public Trustee

Duff Montgomerie, Executive Director, Sport and Recreation Commission

Shirley Nicholson, Chief Executive Officer, Environmental Control Council

#### *New Hampshire*

Julie Mawson, New Hampshire Sea Grant Marine Advisory Service Extension Specialist and Program Director, Odionne Estuarine Reserve

Robert Varney, Commissioner, Department of Environmental Services

Frank Richardson, Wetlands Bureau, New Hampshire Coastal Program

John R. Bush, Wastewater Engineering Bureau

Richard Flanders, Jr., Water Supply and Pollution Control Division, Department of Environmental Services

Paul Raiche, Environmental Sanitation Program, Division of Public Health Services

Donald Normandeau, Executive Director, Fish and Game Department

Chris Mooers, University of New Hampshire

Kirk Stone, Environmental Affairs Director, New Hampshire Audubon Society

Thomas Orfe, Chief Harbormaster, New Hampshire Port Authority

#### *Massachusetts*

Karen Steuer, Center for Coastal Studies

Steve Halterman, Water Pollution Control Division, Department of Environmental Quality

Richard Gallo, Massachusetts State Conservationist

#### *Federal Agencies Canada*

Neil A. Bellefontaine, Regional Director General Scotia-Fundy Region, Department of Fisheries and Oceans

David J. Scarrett, Benthic Fisheries and Aquaculture Division, Department of Fisheries and Oceans

K.C. Curren, Regional Director General, Canadian Coast Guard, Maritimes

#### *United States*

Philip R. Harris, Colonel, Army Corps of Engineers, Planning Directorate

Thomas Bigford, Chief, Habitat and Protected Resources Division, National Marine Fisheries Service

William Hartwig, Regional Director, Fish and Wildlife Service

#### *Other*

Jack Sobel, Director, Habitat Conservation, Center for Marine Conservation, Washington, DC

*AGREEMENT ON*  
*CONSERVATION OF THE MARINE ENVIRONMENT*  
*OF THE GULF OF MAINE*  
*BETWEEN*  
*THE GOVERNMENTS OF THE BORDERING STATES AND PROVINCES*

The Governments of Maine, Massachusetts, New Brunswick, New Hampshire, Nova Scotia, as Parties to this Agreement and;

Considering that the shoreline, seabed, waters and associated natural resources of the Gulf of Maine region, including Georges Bank and the Bay of Fundy, constitute precious public natural resources shared by the contiguous States and Provinces and;

Considering that the natural resources of the Gulf of Maine are interconnected and form part of an overall ecosystem that transcends political boundaries and;

Considering that the sustainable development and use of these resources for recreational and aesthetic enjoyment activities as well as fish and wildlife habitat is dependent on the ecological integrity of the Gulf ecosystem and;

Considering that the planning and management of human activities which may affect the Gulf ecosystem should recognize and be based upon an understanding of the systems' integrity and;

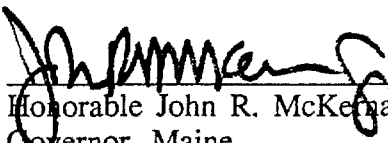
Considering that the Parties to this agreement recognize a shared duty to protect and conserve the renewable and non-renewable resources of the Gulf for the use, benefit and enjoyment of all their citizens, including generations yet to come and;

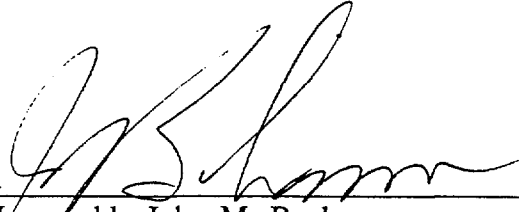
Considering that the most effective means of protecting, conserving and managing the region's resources is through the cooperative pursuit of consistent policies, initiatives and programs and;

Considering that studies conducted by National, State and Provincial governments and other agencies have found that, without prudent management, the future development and use of the Gulf resources may have significant adverse impacts on the environment, economy, and general welfare of the Parties and have agreed to the following:

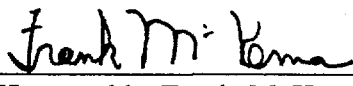
1. The Parties agree to establish a Gulf of Maine Council on the Marine Environment to discuss and act upon environmental issues of common concern including but not limited to:
  - the protection and conservation of the ecological balance within the Gulf of Maine ecosystem;
  - the problem of marine debris and medical waste;
  - the relationship between land use and the marine environment;
  - the sustainable use of resources within the Gulf of Maine;
  - cooperative programs to better protect and conserve the Gulf's natural resources.
2. The Gulf of Maine Council on the Marine Environment will be composed of two representatives from each of the Gulf of Maine States and Provinces to be appointed by their respective Governors and Premiers within 60 days of the effective date of this Agreement.
3. The Gulf of Maine Council on the Marine Environment will produce its first annual report on environmental trends and conditions including specific recommendations on a Gulf of Maine Action Plan within 15 months of its appointment.
4. The Parties agree to minimize actions that would result in degradation of environmental quality or depletion of resources that individually or cumulatively could result in significant adverse impacts on resources leading to loss of sustainable use or environmental viability.
5. The Parties agree to design and develop a coordinated monitoring program to provide improved information for future decisions concerning the Gulf.
6. The Parties agree that the successful conservation of Gulf resources will require the development of additional agreements or protocols on specific issues or concerns that may be raised from time to time.

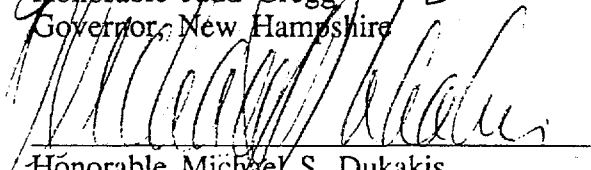
SIGNATURES:

  
Honorable John R. McKernan, Jr.  
Governor, Maine

  
Honourable John M. Buchanan  
Premier, Nova Scotia

  
Honorable Judd Gregg  
Governor, New Hampshire

  
Honourable Frank McKenna  
Premier, New Brunswick

  
Honorable Michael S. Dukakis  
Governor, Massachusetts